UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,031	09/23/2003	Masaya Okita	Soyu C-6B	1821

23474 7590 07/15/2011
FLYNN THIEL BOUTELL & TANIS, P.C.
2026 RAMBLING ROAD
KALAMAZOO, MI 49008-1631

EXAMINER	
PIZIALI, JEFFREY J	

ART UNIT	PAPER NUMBER
2629	

MAIL DATE	DELIVERY MODE
07/15/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/669,031
Filing Date: September 23, 2003
Appellant(s): OKITA, MASAYA

Terryence F. Chapman (Reg. No. 32,549)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed *3 May 2011* appealing from the Office action mailed *31 March 2010*.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 3, 4, 7, 10, 15, and 20-35.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is inaccurate. The Appellant has misrepresented the invention in the brief's summary of claimed subject matter.

Firstly, the summary identifies the "*first voltage*" corresponding to image data as being only "*V1 in Fig. 1.*" This is false.

The Appellant's invention changes the polarity of the applied image signal (*from +V1 to -V1*) so as to prevent liquid crystal deterioration (*e.g., see Specification Paragraph 23*).

Claims 24 and 26 clearly state, "*the first absolute voltage consists of a first positive voltage and a first negative voltage.*"

In actuality, the claimed <u>"*first voltage*"</u> is illustrated in Figure 1 as the first cycle portion of the "*Applied Voltage*" waveform (*e.g., see the top illustrated waveform during time period T1*) including <u>both the +V1 pulse and the -V1 pulse</u>.

The "*first voltage*" cycle portion of the "*Applied Voltage*" waveform coincides with the illustrated "*Absolute Value of Applied Voltage*" (*e.g., see the middle illustrated waveform during time period T1*) being V1.

The "*first voltage*" cycle portion of the "*Applied Voltage*" waveform also coincides with the illustrated "*Optical Transmittance*" (*e.g., see the bottom illustrated waveform during time period T1*) changing from black to white.

Secondly, the summary also identifies the "*second voltage,*" which does not correspond to image data, as being "*-V1 in Fig. 1.*" This is also completely untrue.

Specification Paragraph 24 plainly states that a "*voltage of 0V is applied irrespectively of the image data.*"

Claim 7 clearly states, "*the second voltage is zero volts.*"

In truth, the claimed "*second voltage*" is illustrated in Figure 1 as the second portion of the "*Applied Voltage*" waveform (*e.g., see the top illustrated waveform during time period T1*), which is driven at 0 volts.

The "*second voltage*" portion of the "*Applied Voltage*" waveform coincides with the illustrated "*Absolute Value of Applied Voltage*" (*e.g., see the middle illustrated waveform during time period T1*) being 0 volts.

The "*second voltage*" cycle portion of the "*Applied Voltage*" waveform also coincides with the illustrated "*Optical Transmittance*" (*e.g., see the bottom illustrated waveform during time period T1*) changing from white to black.

In summary:

The applied "*first (image) voltage*" consists of both a +V1 pulse and a -V1 pulse.

The applied "*second (non-image) voltage*" is 0 volts.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal.

Every ground of rejection set forth in the Office action from which the appeal is taken is being maintained by the examiner.

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

US 5,200,846 A	Hiroki et al.	4-1993
US 5,337,171 A	Mase et al.	8-1994
US 7,554,616 B1	Takemura	6-2009
US 5,323,172 A	Koden	6-1994
US 5,748,164 A	Handschy et al.	5-1998

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. *Claims 3, 4, 7, 10, 15, and 20-25* are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Hiroki et al (US 5,200,846 A)*** in view of ***Mase et al (US 5,337,171 A)*** and ***Takemura (US 7,554,616 B1)***.

Please note: Claim order has been rearranged in the Office action to better reflect the order of specificity of the pending claims (*going from broadest to more specific claim language*).

Regarding claim 22, ***Hiroki*** discloses an image display method for a liquid crystal display device [*e.g., Fig. 10*] including

a matrix liquid crystal panel [*e.g., Figs. 10, 12, 13: 123 matrix*] with

a nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*],

consisting of the steps of:

applying a first absolute voltage [*e.g., Fig. 9: Liquid Crystal Potential* = $V_{DD} + V_{SS}$] corresponding to image data [*e.g., image gradation level*] to the nematic liquid crystal during a first time period [*e.g., Fig. 9: write-in unit time t, 325*] in a unit period [*e.g., Fig. 9: 1 Frame*]; and

applying a second absolute voltage [*e.g., Fig. 9: Liquid Crystal Potential = electrical ground, GND*] having a potential [*e.g., zero volts*] and that does not correspond to the image data to the nematic liquid crystal in a second time period [*e.g., Fig. 9: Frame - t = non-write-in time*] different from the first time period in the unit period,

wherein the matrix liquid crystal panel is an active matrix liquid crystal panel [*e.g., Fig. 10: via 113, 122*] (*see the entire document, including Column 2, Line 40 - Column 4, Line 5; Column 5, Line 40 - Column 11, Line 56*).

Should it be shown that ***Hiroki*** discloses a first absolute voltage, as instantly claimed, with insufficient specificity:

Mase discloses a liquid crystal display device [*e.g., Fig. 12*] that includes

a twisted nematic liquid crystal [*e.g., Column 1, Lines 15-35; Column 13, Line 39*],

two electrodes confining the nematic liquid crystal [*e.g., Fig. 12: 16, 17*],

a pair of polarizing plates sandwiching the electrodes [*e.g., Column 15, Lines 20-30; Column 17, Lines 10-20*]; wherein

a unit period being less than or equal to eight milliseconds [*e.g., Column 14, Line 47*]; and wherein

a first absolute voltage [*e.g., Fig. 14: (+), (-)*] consists of

a first positive voltage [*e.g., +20 volts -- Column 18, Line 60*] and

a first negative voltage [*e.g., -20 volts -- Column 18, Line 60*] and

the sum of the first positive voltage and the first negative voltage in the unit period is zero volts (*see the entire document, including Column 17, Line 45 - Column 19, Line 45*).

Should it be shown that both ***Hiroki*** and ***Mase*** disclose a first absolute voltage, as instantly claimed, with insufficient specificity:

Takemura discloses that it was well known and commonly understood at the time of invention to replace a counter/opposing electrode offset voltage level with a zero/ground voltage level (*see the entire document, including Fig. 3; Column 2, Lines 5-30*).

Hiroki, ***Mase***, and ***Takemura*** are all analogous art, because they are from the shared inventive field of driving liquid crystal displays.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use ***Mase's*** polarizing plate arrangement to form ***Hiroki's*** liquid crystal element [*e.g., Fig. 10: 115*] -- so as to form a commercially popular transmissive LCD;

use ***Mase's*** sub-8 millisecond frame period as ***Hiroki's*** frame period [*e.g., Fig. 9: Frame*] -- so as to provide a quick frame rate resulting in a smooth display of full motion video;

use ***Mase's*** ±20 volt positive/negative voltages as ***Hiroki's*** positive/negative voltages [*e.g., Fig. 9:*V_{DD} *&* V_{SS}] -- so as to prevent deterioration of the LCD via polarity reversal and drive the pixel with appropriate voltage levels; and

use ***Takemura's*** zero voltage opposed electrode level as ***Hiroki's*** opposed electrode voltage level [*e.g., Fig. 9:opposed electrode*] -- so as to provide a well known and commonly understood opposed electrode level voltage substitution.

It would have been obvious to one of ordinary skill in the art at the time of invention, because a person of ordinary skill has good reason to pursue the known options within his or her technical grasp (*i.e., using polarizers, driving the display at a fast frame rate; reversing the polarity of drive signals; and applying a zero/ground voltage level to the opposing electrode of the LCD pixel*). If this leads to the anticipated success, it is likely the product is not of innovation but of ordinary skill and common sense.

Regarding claim 33, ***Hiroki*** discloses said nematic liquid crystal is a twisted nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*].

Regarding claim 23, this claim is rejected by the reasoning applied in rejecting claim 22; furthermore, ***Hiroki*** discloses a method for driving a nematic liquid crystal [*e.g., Fig. 10: 115*] in a liquid crystal display device [*e.g., Fig. 10*] that includes

the nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*],

two electrodes [*e.g., Fig. 10: 116, 117*] confining the nematic liquid crystal,

a pair of polarizing plates [*e.g., inherent for a transmissive LCD*] sandwiching the electrodes and

a matrix liquid crystal panel [*e.g., Figs. 10, 12, 13: 123 matrix*] with the nematic liquid crystal,

consisting of the steps of:

applying a first absolute voltage [*e.g., Fig. 9: Liquid Crystal Potential* = $V_{DD} + V_{SS}$] corresponding to image data [*e.g., image gradation level*] to the nematic liquid crystal during a first time period [*e.g., Fig. 9: write-in unit time t, 325*] in a unit period [*e.g., Fig. 9: 1 Frame*]; and

applying a second absolute voltage [*e.g., Fig. 9: Liquid Crystal Potential = electrical ground, GND*] not corresponding to the image data to the nematic liquid crystal during a second separate time period [*e.g., Fig. 9: Frame - t = non-write-in time*] in the unit period,

wherein the unit period includes a separate first input of the first absolute voltage,

a second input of the second absolute voltage and

the optical transmittance of the nematic liquid crystal returns to or remains at an original level during the unit period [*e.g., Fig. 9: Electrical Potential Applied to a Pixel starts and ends*

at the same voltage level for each frame; see also Fig. 2: applied voltage versus LC transmissivity] and

the matrix liquid crystal panel is an active matrix liquid crystal panel [*e.g., Fig. 10: via 113, 122*] (*see the entire document, including Column 2, Line 40 - Column 4, Line 5; Column 5, Line 40 - Column 11, Line 56*).

Should it be shown that ***Hiroki*** discloses a first absolute voltage, as instantly claimed, with insufficient specificity:

Mase discloses a liquid crystal display device [*e.g., Fig. 12*] that includes

a twisted nematic liquid crystal [*e.g., Column 1, Lines 15-35; Column 13, Line 39*],

two electrodes confining the nematic liquid crystal [*e.g., Fig. 12: 16, 17*],

a pair of polarizing plates sandwiching the electrodes [*e.g., Column 15, Lines 20-30; Column 17, Lines 10-20*]; wherein

a unit period being less than or equal to eight milliseconds [*e.g., Column 14, Line 47*]; and wherein

a first absolute voltage [*e.g., Fig. 14: (+), (-)*] consists of

a first positive voltage [*e.g., +20 volts -- Column 18, Line 60*] and

a first negative voltage [*e.g., -20 volts -- Column 18, Line 60*] and

the sum of the first positive voltage and the first negative voltage in the unit period is zero volts (*see the entire document, including Column 17, Line 45 - Column 19, Line 45*).

Should it be shown that both ***Hiroki*** and ***Mase*** disclose a first absolute voltage, as instantly claimed, with insufficient specificity:

Takemura discloses that it was well known and commonly understood at the time of invention to replace a counter/opposing electrode offset voltage level with a zero/ground voltage level (*see the entire document, including Fig. 3; Column 2, Lines 5-30*).

Hiroki, ***Mase***, and ***Takemura*** are all analogous art, because they are from the shared inventive field of driving liquid crystal displays.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use ***Mase's*** polarizing plate arrangement to form ***Hiroki's*** liquid crystal element [*e.g., Fig. 10: 115*] -- so as to form a commercially popular transmissive LCD;

use ***Mase's*** sub-8 millisecond frame period as ***Hiroki's*** frame period [*e.g., Fig. 9: Frame*] -- so as to provide a quick frame rate resulting in a smooth display of full motion video;

use ***Mase's*** ±20 volt positive/negative voltages as ***Hiroki's*** positive/negative voltages [*e.g., Fig. 9:*V_{DD} *&* V_{SS}] -- so as to prevent deterioration of the LCD via polarity reversal and drive the pixel with appropriate voltage levels; and

use ***Takemura's*** zero voltage opposed electrode level as ***Hiroki's*** opposed electrode voltage level [*e.g., Fig. 9:opposed electrode*] -- so as to provide a well known and commonly understood opposed electrode level voltage substitution.

It would have been obvious to one of ordinary skill in the art at the time of invention, because a person of ordinary skill has good reason to pursue the known options within his or her technical grasp (*i.e., using polarizers, driving the display at a fast frame rate; reversing the*

polarity of drive signals; and applying a zero/ground voltage level to the opposing electrode of the LCD pixel). If this leads to the anticipated success, it is likely the product is not of innovation but of ordinary skill and common sense.

Regarding claim 15, ***Mase*** discloses the unit period is less than or equal to eight milliseconds [*e.g., Column 14, Line 47*].

Regarding claim 24, ***Mase*** discloses the first absolute voltage consists of

a first positive voltage [*e.g., +20 volts -- Column 18, Line 60*] and

a first negative voltage [*e.g., -20 volts -- Column 18, Line 60*] and

the sum of the first positive voltage and the first negative voltage in the unit period is zero volts [*e.g., 20 - 20 = 0*].

Regarding claim 34, ***Hiroki*** discloses said nematic liquid crystal is a twisted nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*].

Regarding claim 20, this claim is rejected by the reasoning applied in rejecting claims 22 and 23; furthermore, ***Hiroki*** discloses a method for driving a nematic liquid crystal [*e.g., Fig. 10: 115*] in a liquid crystal display device [*e.g., Fig. 10*] comprising

the nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*],

two electrodes [*e.g., Fig. 10: 116, 117*] sandwiching the nematic liquid crystal,

two polarizing plates [*e.g., inherent for a transmissive LCD*] sandwiching the two electrodes and

a matrix liquid crystal panel [*e.g., Figs. 10, 12, 13: 123 matrix*] with the nematic liquid crystal,

consisting of the steps of:

applying a first voltage [*e.g., Fig. 9: Liquid Crystal Potential* = V_{DD} + V_{SS}] corresponding to image data [*e.g., image gradation level*] to the nematic liquid crystal during a first time period [*e.g., Fig. 9: write-in unit time t, 325*] in a unit period [*e.g., Fig. 9: 1 Frame*]; and

applying a second voltage [*e.g., Fig. 9: Liquid Crystal Potential = electrical ground, GND*] that does not correspond to the image data to the nematic liquid crystal during a second time period [*e.g., Fig. 9: Frame - t = non-write-in time*] in the unit period,

wherein the unit period consists of the first time period and the second time period, and

the optical transmittance of the nematic liquid crystal changes from an initial level corresponding to the second voltage to a level corresponding to the image data during the first time period and

changes from the level corresponding to the image data to the initial level corresponding to the second voltage during the second time period [*e.g., Fig. 9: wherein Electrical Potential Applied to a Pixel starts and ends at the same voltage level for each frame; see also Fig. 2: applied voltage versus LC transmissivity*], and

the matrix liquid crystal panel is an active matrix liquid crystal panel [*e.g., Fig. 10: via 113, 122*] (*see the entire document, including Column 2, Line 40 - Column 4, Line 5; Column 5, Line 40 - Column 11, Line 56*).

Should it be shown that ***Hiroki*** discloses a first absolute voltage, as instantly claimed, with insufficient specificity:

Mase discloses a liquid crystal display device [*e.g., Fig. 12*] that includes

a twisted nematic liquid crystal [*e.g., Column 1, Lines 15-35; Column 13, Line 39*],

two electrodes confining the nematic liquid crystal [*e.g., Fig. 12: 16, 17*],

a pair of polarizing plates sandwiching the electrodes [*e.g., Column 15, Lines 20-30; Column 17, Lines 10-20*]; wherein

a unit period being less than or equal to eight milliseconds [*e.g., Column 14, Line 47*]; and wherein

a first absolute voltage [*e.g., Fig. 14: (+), (-)*] consists of

a first positive voltage [*e.g., +20 volts -- Column 18, Line 60*] and

a first negative voltage [*e.g., -20 volts -- Column 18, Line 60*] and

the sum of the first positive voltage and the first negative voltage in the unit period is zero volts (*see the entire document, including Column 17, Line 45 - Column 19, Line 45*).

Should it be shown that both ***Hiroki*** and ***Mase*** disclose a first absolute voltage, as instantly claimed, with insufficient specificity:

Takemura discloses that it was well known and commonly understood at the time of invention to replace a counter/opposing electrode offset voltage level with a zero/ground voltage level (*see the entire document, including Fig. 3; Column 2, Lines 5-30*).

Hiroki, ***Mase***, and ***Takemura*** are all analogous art, because they are from the shared inventive field of driving liquid crystal displays.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use ***Mase's*** polarizing plate arrangement to form ***Hiroki's*** liquid crystal element [*e.g., Fig. 10: 115*] -- so as to form a commercially popular transmissive LCD;

use ***Mase's*** sub-8 millisecond frame period as ***Hiroki's*** frame period [*e.g., Fig. 9: Frame*] -- so as to provide a quick frame rate resulting in a smooth display of full motion video;

use ***Mase's*** ±20 volt positive/negative voltages as ***Hiroki's*** positive/negative voltages [*e.g., Fig. 9:* V_{DD} *&* V_{SS}] -- so as to prevent deterioration of the LCD via polarity reversal and drive the pixel with appropriate voltage levels; and

use ***Takemura's*** zero voltage opposed electrode level as ***Hiroki's*** opposed electrode voltage level [*e.g., Fig. 9:opposed electrode*] -- so as to provide a well known and commonly understood opposed electrode level voltage substitution.

It would have been obvious to one of ordinary skill in the art at the time of invention, because a person of ordinary skill has good reason to pursue the known options within his or her technical grasp (*i.e., using polarizers, driving the display at a fast frame rate; reversing the polarity of drive signals; and applying a zero/ground voltage level to the opposing electrode of the LCD pixel*). If this leads to the anticipated success, it is likely the product is not of innovation but of ordinary skill and common sense.

Regarding claim 25, ***Hiroki*** discloses the level corresponding to the second voltage is white or black [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 32, ***Hiroki*** discloses said nematic liquid crystal is a twisted nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*].

Regarding claim 21, ***Hiroki*** discloses the liquid crystal display device is a TFT liquid crystal display device [*e.g., Fig. 10: 113, 122*].

Regarding claim 10, ***Hiroki*** discloses the voltage applied in the second time period of the unit period erases an image on the panel by darkening the TFT liquid crystal panel to black during the second time period [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 3, ***Hiroki*** discloses the second voltage applied in the second time period of the unit period erases an image on the panel during the second time period [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 4, ***Hiroki*** discloses erasure of the image displayed on the panel is effected by driving the nematic liquid crystal to display black on the panel [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 7, ***Hiroki*** discloses the liquid crystal display device is normally black and the second voltage is zero volts [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 26, this claim is rejected by the reasoning applied in rejecting claims 20, 22, and 23; furthermore, ***Hiroki*** discloses a method for driving a nematic liquid crystal [*e.g., Fig. 10: 115*] in a liquid crystal display device [*e.g., Fig. 10*] comprising

the nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*],

two electrodes [*e.g., Fig. 10: 116, 117*] sandwiching the nematic liquid crystal,

two polarizing plates [*e.g., inherent for a transmissive LCD*] sandwiching the two electrodes and

a matrix liquid crystal panel [*e.g., Figs. 10, 12, 13: 123 matrix*] with the nematic liquid crystal,

consisting of the steps of:

applying a first absolute voltage [*e.g., Fig. 9: Liquid Crystal Potential* = V_{DD} + V_{SS}] corresponding to image data [*e.g., image gradation level*] to the nematic liquid crystal during a first time period [*e.g., Fig. 9: write-in unit time t, 325*] in a unit period [*e.g., Fig. 9: 1 Frame*]; and

applying a second absolute voltage [*e.g., Fig. 9: Liquid Crystal Potential = electrical ground, GND*] that does not correspond to the image data to the nematic liquid crystal during a second time period [*e.g., Fig. 9: Frame - t = non-write-in time*] in the unit period,

wherein the unit period consists of the first time period and the second time period, and

the optical transmittance of the nematic liquid crystal changes from an initial level corresponding to the second absolute voltage to a level corresponding to the image data during the first time period and

changes from a level corresponding to the image data to the initial level corresponding to the second absolute voltage during the second time period [*e.g., Fig. 9: wherein Electrical Potential Applied to a Pixel starts and ends at the same voltage level for each frame; see also Fig. 2: applied voltage versus LC transmissivity*], and

the first absolute voltage consists of

a first positive voltage [*e.g., Fig. 9:* V_{DD}] and

a first negative voltage [*e.g., Fig. 9:* V_{SS}],

the sum of the first positive voltage and the first negative voltage is zero volts in the unit period, and

the matrix liquid crystal panel is an active matrix liquid crystal panel [*e.g., Fig. 10: via 113, 122*] (*see the entire document, including Column 2, Line 40 - Column 4, Line 5; Column 5, Line 40 - Column 11, Line 56*).

Should it be shown that ***Hiroki*** discloses a first absolute voltage, as instantly claimed, with insufficient specificity:

Mase discloses a liquid crystal display device [*e.g., Fig. 12*] that includes

a twisted nematic liquid crystal [*e.g., Column 1, Lines 15-35; Column 13, Line 39*],

two electrodes confining the nematic liquid crystal [*e.g., Fig. 12: 16, 17*],

a pair of polarizing plates sandwiching the electrodes [*e.g., Column 15, Lines 20-30; Column 17, Lines 10-20*]; wherein

a unit period being less than or equal to eight milliseconds [*e.g., Column 14, Line 47*]; and wherein

a first absolute voltage [*e.g., Fig. 14: (+), (-)*] consists of

a first positive voltage [*e.g., +20 volts -- Column 18, Line 60*] and

a first negative voltage [*e.g., -20 volts -- Column 18, Line 60*] and

the sum of the first positive voltage and the first negative voltage in the unit period is zero volts (*see the entire document, including Column 17, Line 45 - Column 19, Line 45*).

Should it be shown that both ***Hiroki*** and ***Mase*** disclose a first absolute voltage, as instantly claimed, with insufficient specificity:

Takemura discloses that it was well known and commonly understood at the time of invention to replace a counter/opposing electrode offset voltage level with a zero/ground voltage level (*see the entire document, including Fig. 3; Column 2, Lines 5-30*).

Hiroki, ***Mase***, and ***Takemura*** are all analogous art, because they are from the shared inventive field of driving liquid crystal displays.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use ***Mase's*** polarizing plate arrangement to form ***Hiroki's*** liquid crystal element [*e.g., Fig. 10: 115*] -- so as to form a commercially popular transmissive LCD;

use ***Mase's*** sub-8 millisecond frame period as ***Hiroki's*** frame period [*e.g., Fig. 9: Frame*] -- so as to provide a quick frame rate resulting in a smooth display of full motion video;

use ***Mase's*** ±20 volt positive/negative voltages as ***Hiroki's*** positive/negative voltages [*e.g., Fig. 9:* V_{DD} *&* V_{SS}] -- so as to prevent deterioration of the LCD via polarity reversal and drive the pixel with appropriate voltage levels; and

use ***Takemura's*** zero voltage opposed electrode level as ***Hiroki's*** opposed electrode voltage level [*e.g., Fig. 9:opposed electrode*] -- so as to provide a well known and commonly understood opposed electrode level voltage substitution.

It would have been obvious to one of ordinary skill in the art at the time of invention, because a person of ordinary skill has good reason to pursue the known options within his or her technical grasp (*i.e., using polarizers, driving the display at a fast frame rate; reversing the polarity of drive signals; and applying a zero/ground voltage level to the opposing electrode of the LCD pixel*). If this leads to the anticipated success, it is likely the product is not of innovation but of ordinary skill and common sense.

Regarding claim 29, ***Hiroki*** discloses the liquid crystal display device is normally black and the second absolute voltage is zero volts [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 30, ***Hiroki*** discloses the liquid crystal display device is a TFT liquid crystal display device [*e.g., Fig. 10: 113, 122*] including a plurality of pixels [*e.g., Figs. 10, 12, 13: 123*].

Regarding claim 31, ***Hiroki*** discloses the level corresponding to the second absolute voltage is white or black [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 35, ***Hiroki*** discloses said nematic liquid crystal is a twisted nematic liquid crystal [*e.g., see Column 3, Line 68; Column 9, Line 16*].

Regarding claim 27, ***Hiroki*** discloses the second absolute voltage applied in the second time period of the unit period erases an image on the panel during the second time period [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

Regarding claim 28, ***Hiroki*** discloses erasure of the image displayed on the panel is effected by driving the nematic liquid crystal to display black on the panel [*e.g., Fig. 2: 0 volts = 0% transmissivity = black*].

3. *Claims 15, 22-24, 33, and 34* are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Koden (US 5,323,172 A)***.

Regarding claim 15, ***Koden*** discloses the unit period is less than or equal to eight milliseconds [*200 μsec*] (*Column 2, Lines 49 - Column 3, Line 9*).

Regarding claim 22, ***Koden*** discloses an image display method [*Fig. 5*] for a liquid crystal display device [*Fig. 3*] including

a matrix liquid crystal panel (*Column 2, Lines 25-37*) with a liquid crystal [*Fig. 3: LC*] (*Column 1, Line 21 and Column 2, Lines 25-37*), consisting of the steps of:

applying a first absolute voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 5 volts*] corresponding to the image data to the nematic liquid crystal during a first time

period [*Fig. 5:* t_0] in a unit period [*Fig. 5: time period from a first gate electrode pulse start/rise to the next gate electrode pulse start/rise*]; and

applying a second absolute voltage having a potential [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 0 volts*] and that does not correspond to the image data to the liquid crystal in a second time period [*Fig. 5: time period from the first gate electrode pulse end/fall to the next gate electrode pulse start/rise*] different from the first time period in the unit period (*Column 2, Lines 49 - Column 3, Line 9*), wherein

the matrix liquid crystal panel is an active matrix liquid crystal panel (*Column 2, Lines 20-23*).

Although ***Koden*** teaches applying the driving method shown in Figure 5 to a ferroelectric liquid crystal (*Column 2, Line 55*), ***Koden*** also teaches that a twisted nematic liquid crystal can be substituted in the place of a ferroelectric liquid crystal (*Column 1, Lines 13-42 and Column 13, Lines 38-59*).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to apply the driving method shown in Figure 5 to a twisted nematic liquid crystal, so as to result in a display device of high quality [***Koden:*** *Column 1, Lines 13-23*]. Additionally, it would have been obvious because the substitution of one known liquid crystal material for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Regarding claim 23, this claim is rejected by the reasoning applied in rejecting claim 22; furthermore, ***Koden*** discloses a method [*Fig. 5*] for driving a liquid crystal [*Fig. 3: LC*] in a liquid crystal display device [*Fig. 3*] that includes the liquid crystal (*Column 1, Line 21 and Column 2, Lines 25-37*),

two electrodes [*Fig. 3: 8, 11*] confining the liquid crystal [*Fig. 10: 13*],

a pair of polarizing plates sandwiching the electrodes and a matrix liquid crystal panel with the liquid crystal (*Column 2, Lines 9-20; Column 4, Lines 3-25*), consisting of the steps of:

applying a first absolute voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 5 volts*] corresponding to image data to the liquid crystal during a first time period [*Fig. 5:* t_0] in a unit period [*Fig. 5: time period from a first gate electrode pulse start/rise to the next gate electrode pulse start/rise*]; and

applying a second absolute voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 0 volts*] not corresponding to the image data to the liquid crystal during a second separate time period [*Fig. 5: time period from the first gate electrode pulse end/fall to the next gate electrode pulse start/rise*] in the unit period (*Column 2, Lines 49 - Column 3, Line 9*), wherein

the unit period includes a separate first input [*Fig. 5: "voltage applied to liquid crystal" during* t_0] of the first absolute voltage,

a second input [*Fig. 5: "voltage applied to liquid crystal" outside* t_0] of the second absolute voltage and

the optical transmittance [*Fig. 5: "amount of transmitted light"*] of the liquid crystal returns to or remains at an original level during the unit period and

the matrix liquid crystal panel is an active matrix liquid crystal panel (*Column 2, Lines 20-23*).

Regarding claim 24, ***Koden*** discloses the first absolute voltage consists of a first positive voltage [*Fig. 5: +5 volts during the first 1/3*t_0] and a first negative voltage [*Fig. 5: -5 volts during the second 1/3*t_0] and

the sum of the first positive voltage and the first negative voltage in the unit period is zero volts (*Column 2, Lines 49 - Column 3, Line 9*).

Regarding claim 33, ***Koden*** discloses said nematic liquid crystal is a twisted nematic liquid crystal (*Column 1, Line 21 and Column 2, Lines 25-37*).

Regarding claim 34, this claim is rejected by the reasoning applied in rejecting claim 33.

4. *Claims 3, 4, 7, 10, 20, 21, 25-32, and 35* are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Koden (US 5,323,172 A)*** in view of ***Handschy et al (US 5,748,164 A)***.

Regarding claim 3, ***Handschy*** discloses the second voltage [*0 volts*] applied in the second time period [*Fig. 8: SB*] of the unit period [*Fig. 8: S1 + SB*] erases an image [*Fig. 8: Pixel State = OFF = dark*] on the panel during the second time period [*Fig. 8: S1 + SB*] (*Column 15, Lines 8-58*).

Regarding claim 4, ***Handschy*** discloses erasure of the image displayed on the panel is effected by driving the nematic liquid crystal to display black [*Fig. 8: Pixel State = OFF = black*] on the panel (*Column 15, Lines 8-58*).

Regarding claim 7, ***Koden*** discloses the liquid crystal display device is normally black and the second voltage is zero volts (*Column 2, Lines 49 - Column 3, Line 9*).

Handschy also discloses the liquid crystal display device is normally black and the second voltage is zero volts (*Column 9, Lines 36-67*).

Regarding claim 10, ***Handschy*** discloses the voltage [*0 volts*] applied in the second time period [*Fig. 8: SB*] of the unit period [*Fig. 8: S1 + SB*] erases an image on the panel by darkening the TFT liquid crystal panel to black [*Fig. 8: Pixel State = OFF = dark = black*] during the second time period (*Column 15, Lines 8-58*).

Regarding claim 20, this claim is rejected by the reasoning applied in rejecting claims 22 and 23; furthermore, ***Koden*** discloses a method [*Fig. 5*] for driving a liquid crystal [*Fig. 3: LC*] in a liquid crystal display device [*Fig. 3*] comprising

the liquid crystal (*Column 1, Line 21 and Column 2, Lines 25-37*),

two electrodes [*Fig. 3: 8, 11*] sandwiching the liquid crystal [*Fig. 10: 13*],

two polarizing plates sandwiching the two electrodes (*Column 2, Lines 9-20; Column 4, Lines 3-25*) and

a matrix liquid crystal panel [*Fig. 3*] with the liquid crystal, consisting of the steps of:

applying a first voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 5 volts*] corresponding to image data to the nematic liquid crystal during a first time period [*Fig. 5: t_0*] in a unit period [*Fig. 5: time period from a first gate electrode pulse start/rise to the next gate electrode pulse start/rise*]; and

applying a second voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 0 volts*] that does not correspond to image data to the nematic liquid crystal during a second time period [*Fig. 5: time period from the first gate electrode pulse end/fall to the next gate electrode pulse start/rise*] in the unit period, wherein

the unit period consists of the first time period and the second time period, and

the optical transmittance [*Fig. 5: "amount of transmitted light"*] of the liquid crystal changes from an initial level [*Fig. 5: "amount of transmitted light" starts low, prior to t_0*] corresponding to the second voltage to a level [*Fig. 5: "amount of transmitted light" goes high responsive to the "voltage applied to liquid crystal" pulse during t_0*] corresponding to the image data during the first time period (*Column 2, Lines 49 - Column 3, Line 9*) and

the matrix liquid crystal panel is an active matrix liquid crystal panel (*Column 2, Lines 20-23*).

Koden neglects to expressly disclose changing from the level corresponding to image data to the initial level corresponding to the second voltage during the second time period.

Such a light transmission response is likely due to ***Koden's*** use of ferroelectric liquid crystal (*Column 2, Line 55*) -- which exhibits a "*memory effect*" (*Column 2, Line 2*).

Substituting ***Koden's*** twisted nematic liquid crystal in the place of ferroelectric liquid crystal (*Column 1, Lines 13-42 and Column 13, Lines 38-59*), should result in the amount of transmitted light changing back to the initial level after the "voltage applied to liquid crystal" pulse resets to zero volts [*Fig. 5: when period t_0 ends*].

However, should it be shown that ***Koden*** teaches such an optical transmittance response with insufficient specificity:

Handschy discloses a method for driving a nematic liquid crystal (*Column 18, Lines 36-44*) in a liquid crystal display device [*Fig. 4*] comprising

applying a first voltage [*5 volts*] (*Column 9, Lines 36-67*) corresponding to image data to the nematic liquid crystal during a first time period [*Fig. 8: S1*] in a unit period [*Fig. 8: S1 + SB*]; and

applying a second voltage [*0 volts*] that does not correspond to the image data to the nematic liquid crystal during a second time period [*Fig. 8: SB*] in the unit period, wherein

the unit period consists of the first time period and the second time period [*Fig. 8: S1 + SB*], and

the optical transmittance of the nematic liquid crystal changes from an initial level [*Fig. 8: Pixel State = OFF = dark*] corresponding to the second voltage to a level [*Fig. 8: Pixel State = ON = bright*] corresponding to the image data during the first time period and

changes from the level [*Fig. 8: Pixel State = ON = bright*] corresponding to the image data to the initial level [*Fig. 8: Pixel State = OFF = dark*] corresponding to the second voltage during the second time period (*Column 15, Lines 8-58*), and

the matrix liquid crystal panel is an active matrix liquid crystal panel [*Fig. 4*] (*Column 8, Line 61 - Column 9, Line 23*).

Koden and ***Handschy*** are analogous art, because they are from the shared inventive field of driving methods applicable to both ferroelectric liquid crystal and twisted nematic liquid crystal displays (***Koden:*** *Column 1, Lines 13-42 and Column 13, Lines 38-59 &* ***Handschy:*** *Column 18, Lines 36-44*).

Therefore, it would have been obvious to one having ordinary skill in the art to use ***Handschy's*** blackout technique between ***Koden's*** voltage pulse applications to the gate/source electrodes, so as to maintain proper brightness levels during image display (***Handschy:*** *Column 15, Lines 30-58*).

Regarding claim 21, ***Koden*** discloses the liquid crystal display device is a TFT liquid crystal display device (*Fig. 3; Column 2, Lines 25-37*).

Regarding claim 25, ***Koden*** discloses the level corresponding to the second voltage is white [*Fig. 5: "amount of transmitted light" = high = white*] or black [*Fig. 5: "amount of transmitted light" = low = black*] (*Column 2, Lines 49 - Column 3, Line 9*).

Regarding claim 26, this claim is rejected by the reasoning applied in rejecting claims 20 and 22-24; furthermore, ***Koden*** discloses a method [*Fig. 5*] for driving a liquid crystal [*Fig. 3: LC*] in a liquid crystal display device [*Fig. 3*] comprising

the liquid crystal (*Column 1, Line 21 and Column 2, Lines 25-37*),

two electrodes [*Fig. 3: 8, 11*] sandwiching the liquid crystal [*Fig. 10: 13*],

two polarizing plates sandwiching the two electrodes (*Column 2, Lines 9-20; Column 4, Lines 3-25*) and

a matrix liquid crystal panel [*Fig. 3*] with a liquid crystal, consisting of the steps of:

applying a first absolute voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 5 volts*] corresponding to image data to the liquid crystal during a first time period [*Fig. 5: t_0*] in a unit period [*Fig. 5: time period from a first gate electrode pulse start/rise to the next gate electrode pulse start/rise*]; and

applying a second absolute voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 0 volts*] that does not correspond to the image data to the liquid crystal during a second time period [*Fig. 5: time period from the first gate electrode pulse end/fall to the next gate electrode pulse start/rise*] in the unit period, wherein

the unit period consists of the first time period and the second time period, and

the optical transmittance [*Fig. 5: "amount of transmitted light"*] of the liquid crystal changes from an initial level [*Fig. 5: "amount of transmitted light" starts low, prior to t_0*] corresponding to the second absolute voltage to a level [*Fig. 5: "amount of transmitted light" goes high responsive to the "voltage applied to liquid crystal" pulse during t_0*] corresponding to the image data during the first time period and

the first absolute voltage consists of a first positive voltage [*Fig. 5: +5 volts during the first $1/3t_0$*] and a first negative voltage [*Fig. 5: -5 volts during the second $1/3t_0$*],

the sum of the first positive voltage and the first negative voltage is zero volts in the unit period (*Column 2, Lines 49 - Column 3, Line 9*), and

the matrix liquid crystal panel is an active matrix liquid crystal panel (*Column 2, Lines 20-23*).

Regarding claim 27, this claim is rejected by the reasoning applied in rejecting claim 3.

Regarding claim 28, this claim is rejected by the reasoning applied in rejecting claim 4.

Regarding claim 29, this claim is rejected by the reasoning applied in rejecting claim 7.

Regarding claim 30, ***Koden*** discloses the liquid crystal display device is a TFT liquid crystal display device including a plurality of pixels (*Fig. 3; Column 2, Lines 25-37*).

Regarding claim 31, this claim is rejected by the reasoning applied in rejecting claim 25.

Regarding claim 32, this claim is rejected by the reasoning applied in rejecting claim 33.

Regarding claim 35, this claim is rejected by the reasoning applied in rejecting claim 33.

(10) Response to Argument

A. The rejection of Claims 3, 4, 7, 10, 15, and 20-25 under 35 U.S.C. 103(a) as being unpatentable over Hiroki et al (US 5,200,846 A) in view of Mase et al (US 5,337,171 A) and Takemura (US 7,554,616 B1). [Responsive to pages 6-9 of the brief.]

The Appellant argues ***Hiroki*** does not teach, "*applying a first voltage corresponding to image data to the nematic liquid crystal during a first time period in a unit period; and applying a second voltage that does not correspond to the image data to the nematic liquid crystal during a second time period in the unit period*" as recited in independent claim 20 (*see brief page 6*). The examiner respectfully disagrees.

The above argued subject matter is illustrated in Figure 1 of the instant invention:

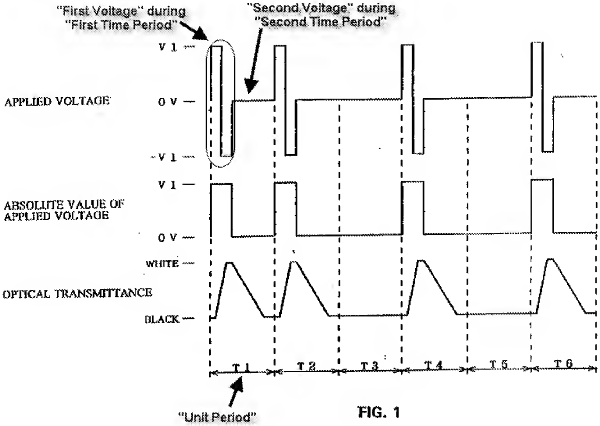
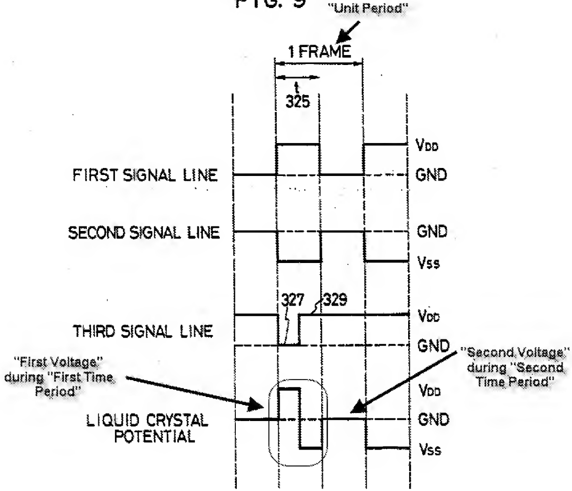


FIG. 1

Now compare Figure 1 of the instant invention with the nearly identical Figure 9 of *Hiroki*:

FIG. 9



Hiroki discloses applying a first voltage [*e.g., Fig. 9: Liquid Crystal Potential = the* V_{DD} *pulse followed by the* V_{SS} *pulse*] corresponding to image data [*e.g., image gradation level*] to a nematic liquid crystal [*e.g., Fig. 10: 115; Column 3, Line 68; Column 9, Line 16*] during a first time period [*e.g., Fig. 9: write-in unit time t, 325*] in a unit period [*e.g., Fig. 9: 1 Frame*]; and

applying a second voltage [*e.g., Fig. 9: Liquid Crystal Potential = electrical ground, GND*] that does not correspond to the image data to the nematic liquid crystal during a second time period [*e.g., Fig. 9: Frame - t = non-write-in time*] in the unit period (*see Column 2, Line 40 - Column 4, Line 5*).

Hiroki's nematic liquid crystal is driven in an identical fashion as the instantly claimed invention. ***Hiroki's*** "*Liquid Crystal Potential*" (in Fig. 9) is a mirror image of the instant application's "*Applied Voltage*" (in Fig. 1):

A positive polarity voltage ($+V_{DD} = +V1$) is first followed by a negative polarity voltage ($-VSS = -V1$) and is then followed by a zero voltage (*GND = 0 volts*).

The Appellant contends, "*Referring to Figure 9 of this reference, the Examiner has alleged that the liquid crystal potential corresponds to the first absolute voltage of Claim 22 and that the liquid crystal potential equals* $V_{DD} + V_{SS}$. *However, Figure 9 of* ***Hiroki*** *only shows three levels of the liquid crystal potential which are specifically GND, VDD and Vss. As such,* ***Hiroki*** *et al does not show* $V_{DD} + V_{SS}$" (*see brief page 7*). The examiner respectfully disagrees.

The Appellant has misunderstood what the examiner wrote in the Final Office action.

The rejection of claim 22 identified ***Hiroki's*** "*Fig. 9: Liquid Crystal Potential* = V_{DD} + V_{SS}" as corresponding to the "*first absolute voltage*" as instantly claimed.

The rejection is not suggesting that Figure 9 illustrates a voltage value V_{DD} being mathematically added to a voltage value V_{SS}.

The rejection's citation of "V_{DD} + V_{SS}" is intended to mean, "*the positive polarity V_{DD} pulse followed by the negative polarity V_{SS} pulse.*"

The reason for this is because pending claims 24 and 26 state, "*the first absolute voltage consists of a first positive voltage and a first negative voltage.*"

It is respectfully noted that, in the broadly worded context of claim 22 (which does not explicitly discuss voltage polarities), either of ***Hiroki's*** V_{DD} and V_{SS} voltages clearly constitutes a "*first absolute voltage*" as instantly claimed. A fact the Appellant nowhere disputes in the brief.

The Appellant next contends, "*With respect to the second absolute voltage of Claim 22, the Examiner has contended that Figure 9 of* ***Hiroki*** *shows, by reference to 'Liquid Crystal Potential = electrical ground, GND' as being applied in a non-write-in time (= Frame - t). The second absolute voltage recited in Claim 22 is a fixed voltage because it has a potential as recited therein. In contrast thereto, in Figure 9 of* ***Hiroki,*** *the voltage applied in the non-write-in time varies with the line exemplified by GND for the first signal line, GND for the second signal line and VDD for the third signal line. That is, the voltage applied in the 'Frame - t' period in the* ***Hiroki*** *system in Figure 9 is variable. Therefore, the ILC potential of the pixels of different signal lines cannot be constant*" (*see brief page 7*). The examiner respectfully disagrees.

In response to Appellant's argument that the references fail to show certain features of Appellant's invention, it is noted that the features upon which Appellant relies (i.e., *the second absolute voltage recited in Claim 22 is a fixed voltage because it has a potential as recited therein*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

None of the pending claims recites the argued subject matter of a "*fixed voltage,*" a "*non-variable voltage,*" "*lines*" or a "*constant potential.*"

The various voltages that ***Hiroki*** applies to the first, second, and third signal lines is immaterial to the instantly claimed invention. The only voltage that matters is the one applied to the liquid crystal (*i.e., Fig. 9's "Liquid Crystal Potential").*

Claim 22 recites, "*applying a second absolute voltage having a potential and that does not correspond to the image data to the nematic liquid crystal in a second time period different from the first time period in the unit period.*"

Claim 29 further clarifies, "*the second absolute voltage is zero volts.*"

As such, ***Hiroki*** clearly discloses applying a second absolute voltage [*e.g., Fig. 9: Liquid Crystal Potential = electrical ground, GND*] having a potential and that does not correspond to the image data to the nematic liquid crystal in a second time period [*e.g., Fig. 9: Frame - t = non-write-in time*] different from the first time period [*e.g., Fig. 9: write-in unit time t, 325*] in the unit period [*e.g., Fig. 9: 1 Frame*].

The Appellant contends the ***Mase*** reference, "*has no disclosure with respect to driving the nematic liquid crystal by steps consisting of applying a first voltage corresponding to image data to the nematic liquid crystal during a first time period in a unit period and applying a second voltage that does not correspond to the image data to the nematic liquid crystal during a second time period. Therefore,* ***Mase et al*** *adds nothing to the primary* ***Hiroki et al*** *reference*" (*see brief page 8*). The examiner respectfully disagrees.

Should it be shown that ***Hiroki*** discloses a first absolute voltage, as instantly claimed, with insufficient specificity:

Mase discloses a liquid crystal display device [*e.g., Fig. 12*] that includes

a twisted nematic liquid crystal [*e.g., Column 1, Lines 15-35; Column 13, Line 39*],

two electrodes confining the nematic liquid crystal [*e.g., Fig. 12: 16, 17*],

a pair of polarizing plates sandwiching the electrodes [*e.g., Column 15, Lines 20-30; Column 17, Lines 10-20*]; wherein

a unit period being less than or equal to eight milliseconds [*e.g., Column 14, Line 47*]; and wherein

a first absolute voltage [*e.g., Fig. 14: (+), (-)*] consists of

a first positive voltage [*e.g., +20 volts -- Column 18, Line 60*] and

a first negative voltage [*e.g., -20 volts -- Column 18, Line 60*] and

the sum of the first positive voltage and the first negative voltage in the unit period is zero volts (*see the entire document, including Column 17, Line 45 - Column 19, Line 45*).

It would have been obvious to one having ordinary skill in the art at the time of invention to use ***Mase's*** polarizing plate arrangement to form ***Hiroki's*** liquid crystal element [*e.g., Fig. 10: 115*] -- so as to form a commercially popular transmissive LCD;

use ***Mase's*** sub-8 millisecond frame period as ***Hiroki's*** frame period [*e.g., Fig. 9: Frame*] -- so as to provide a quick frame rate resulting in a smooth display of full motion video; and

use ***Mase's*** ±20 volt positive/negative voltages as ***Hiroki's*** positive/negative voltages [*e.g., Fig. 9:* V_{DD} *&* V_{SS}] -- so as to prevent deterioration of the LCD via polarity reversal and drive the pixel with appropriate voltage levels.

The Appellant contends the ***Takemura*** reference, "*has no teaching with respect to driving a liquid crystal display device using a nematic liquid crystal by a method consisting of the steps of applying a first voltage corresponding to image data to the liquid crystal during a first time period in a unit period and applying a second voltage that does not correspond to image data to the liquid crystal during a second time period in the unit period. Therefore,* ***Takemura*** *in combination with* ***Mase*** *and* ***Hiroki*** *do not even present a showing of prima facie obviousness under 35 USC 103(a)*" (*see brief pages 8-9*). The examiner respectfully disagrees.

Should it be shown that both ***Hiroki*** and ***Mase*** disclose a first absolute voltage, as instantly claimed, with insufficient specificity:

Takemura discloses that it was well known and commonly understood at the time of invention to replace a counter/opposing electrode offset voltage level with a zero/ground voltage level (*see the entire document, including Fig. 3; Column 2, Lines 5-30*).

It would have been obvious to one having ordinary skill in the art at the time of invention to use ***Takemura's*** zero voltage opposed electrode level as ***Hiroki's*** opposed electrode voltage level [*e.g., Fig. 9:opposed electrode*] -- so as to provide a well known and commonly understood opposed electrode level voltage substitution.

The Appellant contends, "*for the same reasons advanced above for Claim 20, Claims 22, 23 and 26 are also believed to be patentably distinguishable over* ***Hiroki*** *and* ***Mase*** *and* ***Takemura*** *in combination*" (*see brief page 9*). The examiner respectfully disagrees.

As already explained above, the combination of ***Hiroki*** *and* ***Mase*** *and* ***Takemura*** would clearly render obvious the instantly claimed invention.

Moreover, the specific subject matter argued by the Appellant is clearly taught by ***Hiroki***. All one needs do is compare the instant application's Fig. 1 "*Applied Voltage*" with ***Hiroki's*** Fig.

9 "*Liquid Crystal Potential*" to see that the instant invention does not distinguish in any way over the cited prior art.

B. The rejection of Claims 15, 22-24, 33, and 34 under 35 U.S.C. 103(a) as being unpatentable over Koden (US 5,323,172 A). [Responsive to pages 9-11 of the brief.]

The Appellant contends, "*The **Koden** reference discloses a ferroelectric liquid crystal display device*" (*see brief page 9*). The examiner respectfully disagrees.

Although ***Koden*** teaches applying the driving method shown in Figure 5 to a ferroelectric liquid crystal (*Column 2, Line 55*), ***Koden*** also teaches that a twisted nematic liquid crystal can be substituted in the place of a ferroelectric liquid crystal (*Column 1, Lines 13-42 and Column 13, Lines 38-59*).

As a reminder, here again is the instant application's Figure 1:

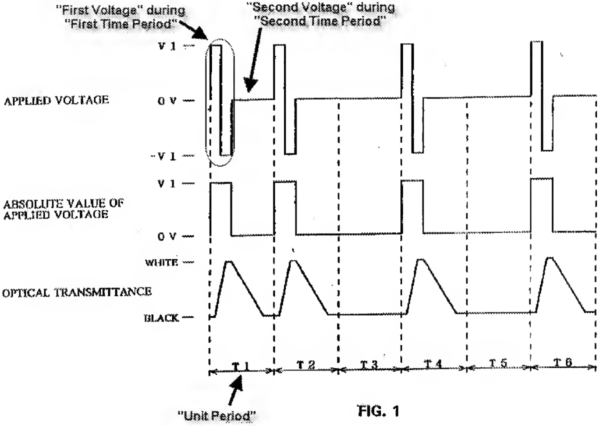
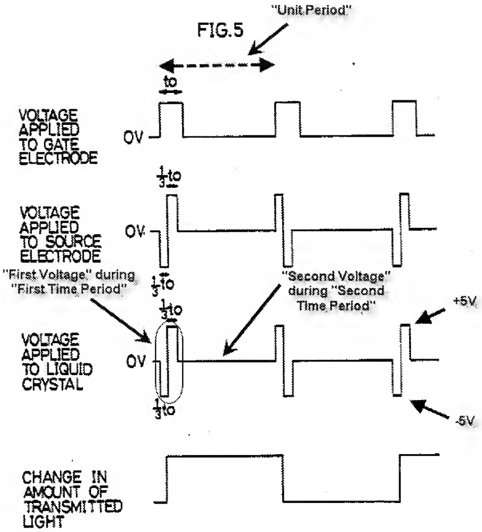


FIG. 1

Now compare Figure 1 of the instant invention with the nearly identical Figure 5 of *Koden*:

FIG.5



The Appellant contends, "***Koden*** *discloses in Figure 5 the voltage applied to a liquid crystal. The voltage consists of a negative value, a positive value and zero value. However, this reference does not apply the absolute voltage to the liquid crystal.* ***Koden*** *additionally does not disclose that the voltage corresponds to the image data. In column 2, lines 43-46, the Koden reference merely discloses that when a display at a certain pixel is not changed for a long period of time, a voltage of the same polarity is applied to the ferro-electric liquid crystal of the pixel. As such, the* ***Koden*** *reference uses both negative and positive voltages rather than the absolute voltage. As such, Claim 22 is clearly patentably distinguishable over this reference*" (*see brief page 10*). The examiner respectfully disagrees.

The Appellant's argument that none of ***Koden's*** applied negative voltage value (-5V), positive voltage value (+5V), or zero voltage value constitute an "*absolute voltage value*" is frankly flabbergasting in its bald-faced wrongness.

An "*absolute value*" is merely a positive real number equal to a given real number, but simply disregarding its sign. Each and every one of ***Koden's*** applied negative voltage (-5V), positive voltage (+5V), and zero voltage inherently constitute an "*absolute voltage.*"

Moreover, pending claims 24 and 26 state, "*the first absolute voltage consists of a first positive voltage and a first negative voltage.*"

As such, ***Koden*** clearly discloses applying a first absolute voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 5 volts*] corresponding to image data [*e.g., wherein the applied voltage inherently corresponds to image data, as it creates an image on the display*] to the liquid crystal during a first time period [*Fig. 5:* t_0] in a unit period [*Fig. 5: time period from a first gate electrode pulse start/rise to the next gate electrode pulse start/rise*]; wherein

the first absolute voltage [*Fig. 5: "voltage applied to liquid crystal" = absolute value of 5 volts*] consists of a first positive voltage [*Fig. 5: +5 volts during the first* $1/3t_0$] and a first negative voltage [*Fig. 5: -5 volts during the second* $1/3t_0$] and the sum of the first positive voltage and the first negative voltage in the unit period is zero volts (*Column 2, Lines 49 - Column 3, Line 9*), as recited in instant claim 24, and as illustrated as "*applied voltage*" in the instant invention's Figure 1.

The Appellant contends, "***Koden*** *does not disclose that the optical transmittance of the nematic liquid crystal returns to or remains at an original level during the unit period. In Figure 5, a change in the amount of transmitted light turns to the positive value from zero at 1/3* t_o*, and remains at the positive value until the unit period. The change in amount of transmitted light returns to zero at 1/3* t_o *of next unit period. In view of the above, Claim 23 is also believed to be patentably distinguishable over* ***Koden***" (*see brief page 11*). The examiner respectfully disagrees.

The Appellant's own statement above supports the conclusion that ***Koden*** does indeed teach such subject matter.

Where the "*original level*" is taken to be ***Koden's*** "*positive value*" (*i.e., a bright light level*), the Applicant admits "*a change in the amount of transmitted light turns [i.e., "returns"] to the positive value from zero at 1/3* t_o."

The Appellant contends, "*Claim 15 recites, 'the unit period is less than or equal to eight milliseconds.'* ***Koden*** *discloses that the pulse width necessary for the switching is 200 μsec, but does not teach that the unit period is less than or equal to eight milliseconds*" (*see brief page 11*). The examiner respectfully disagrees.

Koden discloses the unit period is less than or equal to eight milliseconds [*200 μsec*] (*Column 2, Lines 49 - Column 3, Line 9*).

It is respectfully noted that 200 μsec (*i.e., 0.2 milliseconds*) is a good deal shorter than eight milliseconds.

Moreover, ***Koden*** teaches, "*When the liquid crystal display device having 1000 scanning lines is implemented, a time required for rewriting one screen is 600 μsec*" (*see Column 3, Line 3*).

It is respectfully noted that 600 μsec (*i.e., 0.6 milliseconds*) is also quite a good deal shorter than eight milliseconds.

Koden's display will be completely rewritten more than thirteen times in 8 milliseconds!

Quite obviously, ***Koden's*** unit period [*Fig. 5: time period from a first gate electrode pulse start/rise to the next gate electrode pulse start/rise*] must be less than eight milliseconds.

C. The rejection of Claims 3, 4, 7, 10, 20, 21, 25-32, and 35 under 35 U.S.C. 103(a) as being unpatentable over Koden (US 5,323,172 A) in view of Handschy et al (US 5,748,164 A). [Responsive to pages 11-14 of the brief.]

The Appellant contends, "*The Examiner admits **Koden** does not disclose that optical transmittance of the nematic liquid crystal changes from the level corresponding to the image data to the initial level corresponding to the second voltage during the second time period, and cites **Handschy** to cure this deficiency*" (*see brief page 12*). The examiner respectfully disagrees.

The examiner has never made any such admission. The examiner respectfully disagrees of the Appellant's characterization.

Koden neglects to expressly disclose changing from the level corresponding to image data to the initial level corresponding to the second voltage during the second time period.

Such a light transmission response is likely due to ***Koden's*** use of ferroelectric liquid crystal (*Column 2, Line 55*) -- which exhibits a "*memory effect*" (*Column 2, Line 2*).

Substituting ***Koden's*** twisted nematic liquid crystal in the place of ferroelectric liquid crystal (*Column 1, Lines 13-42 and Column 13, Lines 38-59*), should result in the amount of transmitted light changing back to the initial level after the "*voltage applied to liquid crystal*" pulse resets to zero volts [*Fig. 5: when period t_0 ends*].

Handschy has been recited in the event that ***Koden*** teaches such an optical transmittance response (*which is arguably inherent to the nematic liquid crystal embodiment*) with insufficient specificity.

The Appellant contends, "***Handschy** shows in Figure 8 the ON/OFF state of the pixel in time period. Figure 8 also shows the brightness for each subframe. As shown in Figure 8, the brightness increases in frame F1' and decreases in frame F2' Thus, **Handschy** does not disclose that optical transmittance changes from an initial level corresponding to the second voltage to a level corresponding to the image data during the first time period and changes from the level corresponding to the image data to the initial level corresponding to the second voltage during the second time period*" (*see brief page 12*). The examiner respectfully disagrees.

For easy reference, here is ***Handschy's*** Figure 8:

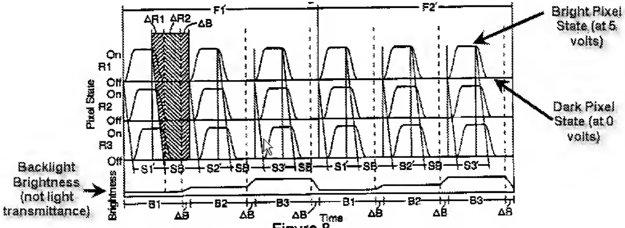


Figure 8

Handschy discloses a method for driving a nematic liquid crystal (*Column 18, Lines 36-44*) in a liquid crystal display device [*Fig. 4*] comprising

applying a first voltage [*5 volts*] (*Column 9, Lines 36-67*) corresponding to image data to the nematic liquid crystal during a first time period [*Fig. 8: S1*] in a unit period [*Fig. 8: S1 + SB*]; and

applying a second voltage [*0 volts*] that does not correspond to the image data to the nematic liquid crystal during a second time period [*Fig. 8: SB*] in the unit period, wherein

the unit period consists of the first time period and the second time period [*Fig. 8: S1 + SB*], and

the optical transmittance of the nematic liquid crystal changes from an initial level [*Fig. 8: Pixel State = OFF = dark*] corresponding to the second voltage to a level [*Fig. 8: Pixel State = ON = bright*] corresponding to the image data during the first time period and

changes from the level [*Fig. 8: Pixel State = ON = bright*] corresponding to the image data to the initial level [*Fig. 8: Pixel State = OFF = dark*] corresponding to the second voltage during the second time period (*Column 15, Lines 8-58*), and

the matrix liquid crystal panel is an active matrix liquid crystal panel [*Fig. 4*] (*Column 8, Line 61 - Column 9, Line 23*).

The Appellant contends, "*in Figure 8 of **Handschy**, the brightness changes depending on the subframes rather than on the time period. Moreover, the brightness level of **Handschy** does not correspond to the image data or to the voltage. The brightness level increases as the amount*

of light available for the subframe increases" (*see brief page 12*). The examiner respectfully disagrees.

Firstly, each of ***Handschy's*** subframes inherently constitutes a time period.

Secondly, none of the instant claims recites "*brightness*" subject matter.

In response to Appellant's argument that the references fail to show certain features of Appellant's invention, it is noted that the features upon which Appellant relies (i.e., *brightness changes, brightness levels corresponding to image data or to voltages, etc.*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Thirdly, the Appellant is confused about what the "*Brightness*" illustrated in Figure 8 of ***Handschy*** actually represents. The illustrated "*Brightness*" is a representation of backlight brightness. Backlight brightness has no bearing on the liquid crystal's light transmittance. Only the pixel on/off state impacts light transmittance.

Fourthly, ***Handschy*** expressly teaches, "*By controlling each of the pixels in this way the overall array of pixels may be used to form an image consisting of bright or dark pixels at any*

given time" (*see Column 9, Lines 64-67*). Therefore, the light transmittance (*and the brightness level*) of ***Handschy*** does indeed correspond to image data as well as the applied voltage.

The Appellant contends, "*Claims 3 and 27 recite, 'the second voltage applied in the second time period of the unit period erases an image on the panel during the second time period.' Claims 4 and 28 recite, 'erasure of the image displayed on the panel is effected by driving the nematic liquid crystal to display black on the panel.' Claim 10 recites, 'the voltage applied in the second time period of the unit period erases an image on the panel by darkening the TFT liquid crystal panel to black during the second time period.'* ***Koden*** *and* ***Handschy*** *do not teach the erasure of the image*" (*see brief page 12*). The examiner respectfully disagrees.

The Appellant appears to be under the erroneous impression that the prior art does not teach driving a liquid crystal to an opaque state.

Handschy does indeed disclose that erasure of the image displayed on the panel is effected by driving the nematic liquid crystal to display black [*Fig. 8: Pixel State = OFF = black*] on the panel (*Column 15, Lines 8-58*). For example: in a black pixel state, no image can possibly be displayed.

As already explained above, the combination of ***Koden*** and ***Handschy*** would clearly render obvious the instantly claimed invention.

The specific voltage application subject matter argued by the Appellant is clearly taught by ***Koden***. All one needs do is compare the instant application's Fig. 1 "*Applied Voltage*" with ***Koden's*** Fig. 5 "*Voltage Applied to Liquid Crystal*" to see that the instant invention does not distinguish in any way over the cited prior art.

Moreover, the specific optical transmittance subject matter argued by the Appellant is clearly taught by ***Handschy*** (*and is nothing more than the inherent response of nematic liquid crystal to driving voltages in the first place*). All one needs do is compare the instant application's Fig. 1 "*Optical Transmittance*" with ***Handschy's*** Fig. 8 "*Pixel States = On/Off*" to see that the instant invention does not distinguish in any way over the cited prior art.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jeff Piziali/

Primary Examiner, Art Unit 2629

14 July 2011

Conferees:

Alexander Beck

Supervisory Patent Examiner, Art Unit 2629

/Alexander S. Beck/

Supervisory Patent Examiner, Art Unit 2629

Bipin Shalwala

Supervisory Patent Examiner, Art Unit 2629

/Bipin Shalwala/

Supervisory Patent Examiner, Art Unit 2629